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Nielsen

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(54) **METHODS AND APPARATUS TO COMMUNICATE AUDIENCE MEASUREMENT INFORMATION**

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(52) **U.S. Cl.**

CPC ... ***H04N 21/44008*** (2013.01); ***H04N 21/44204*** (2013.01); ***H04N 21/44222*** (2013.01); ***H04N 21/4532*** (2013.01); ***H04N 21/6181*** (2013.01); ***H04N 21/6582*** (2013.01); ***H04N 21/8358*** (2013.01)

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CPC H04N 21/44213; H04N 21/44222; H04N 21/45; H04N 21/4508; H04N 21/4532

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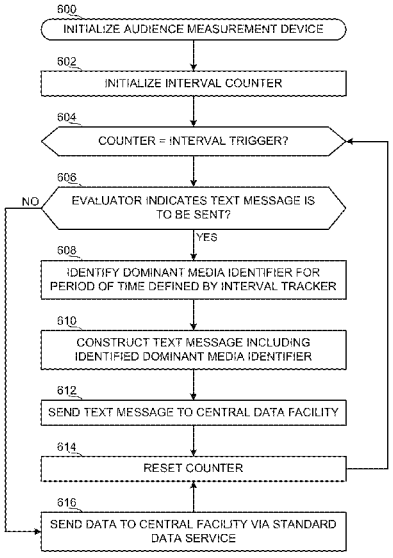
(57) **ABSTRACT**

Methods and apparatus to communicate audience measurement information are disclosed. An example method includes analyzing a plurality of media identifiers collected over a first period of time to identify a dominant one of the media identifiers for the first period of time; and communicating the dominant media identifier for the first period of time via a text-only messaging service to a storage facility.

19 Claims, 8 Drawing Sheets



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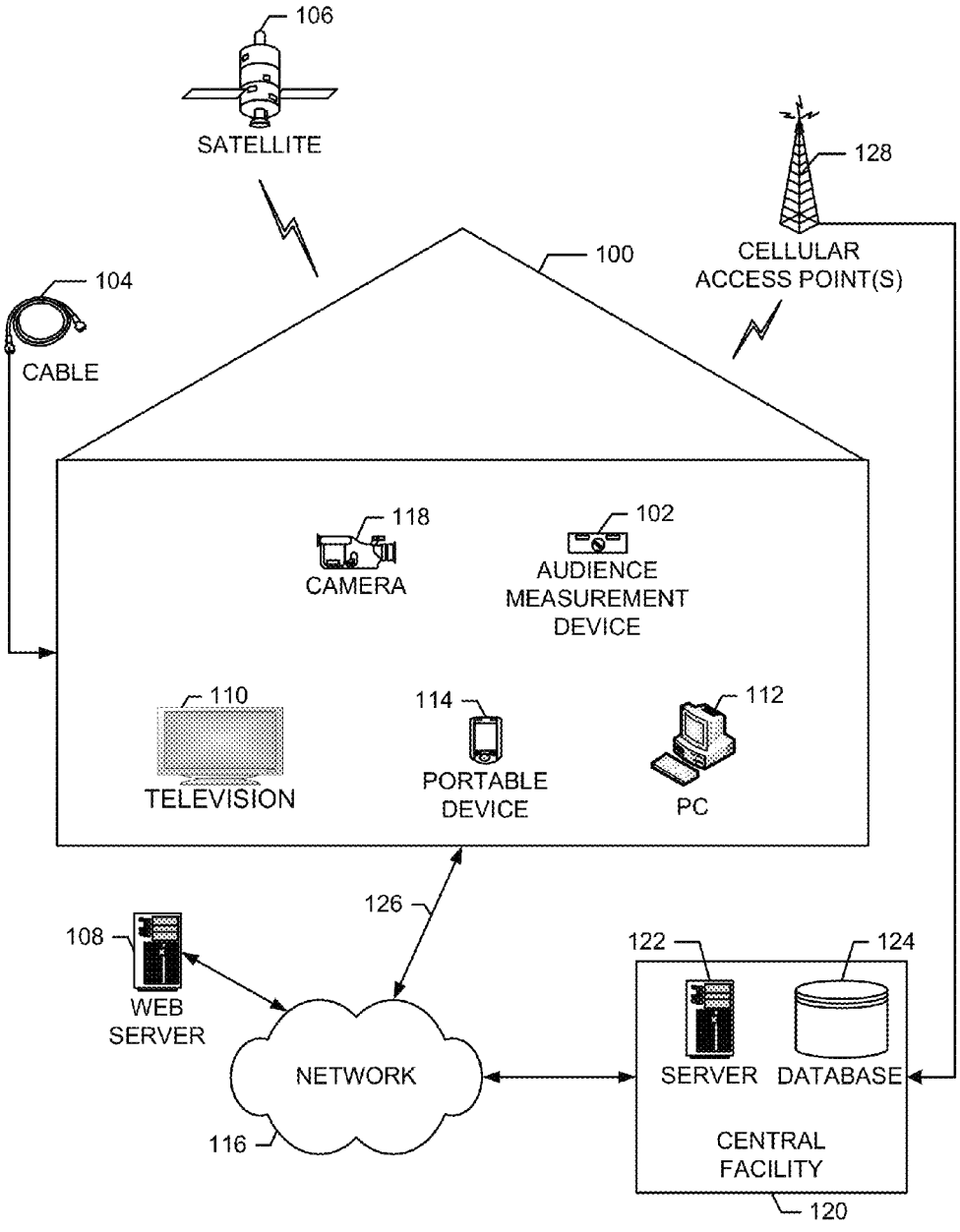
106
SATELLITE
128
CELLULAR ACCESS POINT(S)
100
104
CABLE
118
CAMERA
102
AUDIENCE MEASUREMENT DEVICE
110
TELEVISION
114
PORTABLE DEVICE
112
PC
126
108
WEB SERVER
NETWORK
116
122
124
SERVER
DATABASE
CENTRAL FACILITY
120

FIG. 1

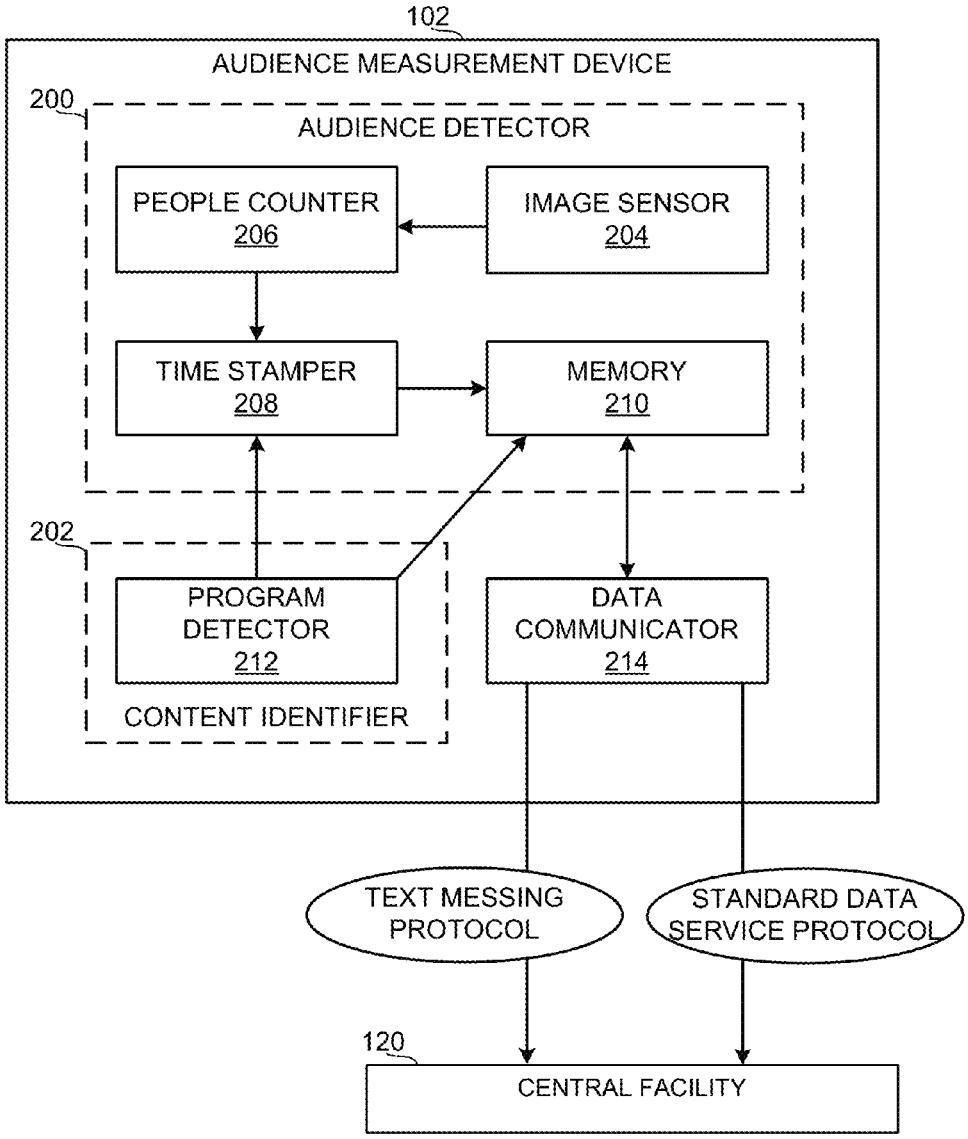
102
AUDIENCE MEASUREMENT DEVICE
200
AUDIENCE DETECTOR
PEOPLE COUNTER
206
IMAGE SENSOR
204
TIME STAMPER
208
MEMORY
210
202
PROGRAM
DETECTOR
212
DATA
COMMUNICATOR
214
CONTENT IDENTIFIER
TEXT MESSING
PROTOCOL
STANDARD DATA
SERVICE PROTOCOL
120
CENTRAL FACILITY

FIG. 2

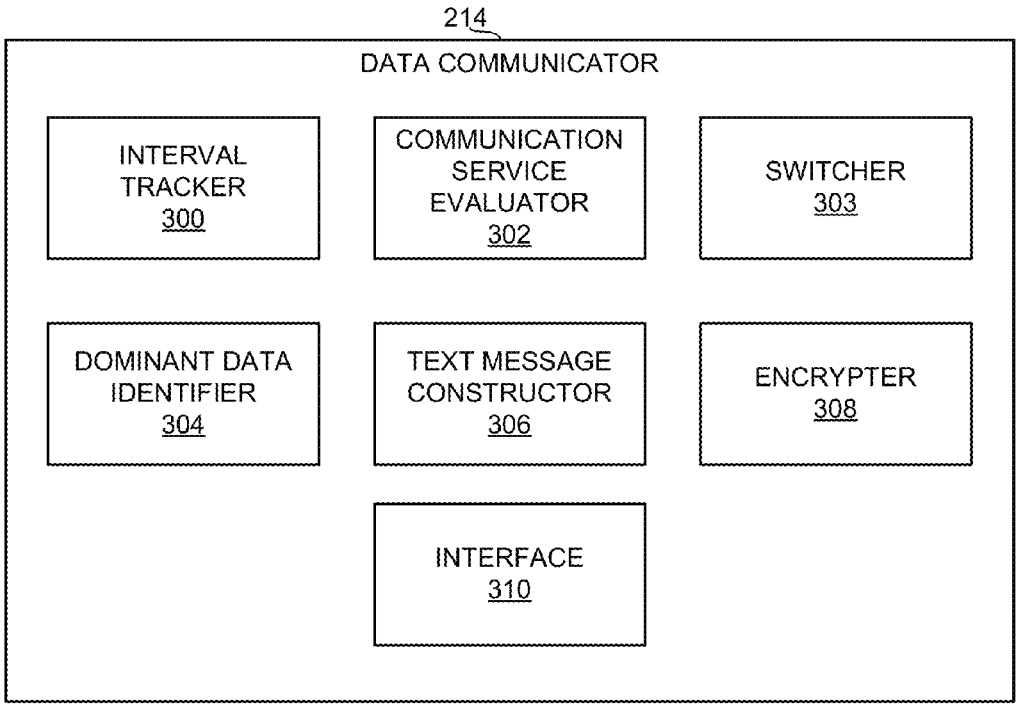
214
DATA COMMUNICATOR
INTERVAL TRACKER 300
COMMUNICATION SERVICE EVALUATOR 302
SWITCHER 303
DOMINANT DATA IDENTIFIER 304
TEXT MESSAGE CONSTRUCTOR 306
ENCRYPTER 308
INTERFACE 310

FIG. 3

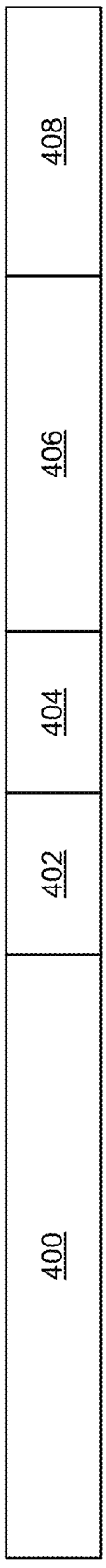

FIG. 4

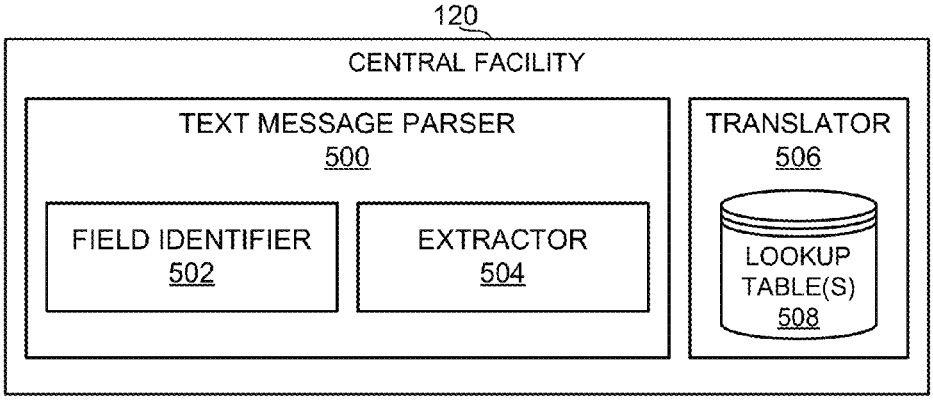
120
CENTRAL FACILITY
TEXT MESSAGE PARSER
500
FIELD IDENTIFIER
502
EXTRACTOR
504
TRANSLATOR
506
LOOKUP
TABLE(S)
508

FIG. 5

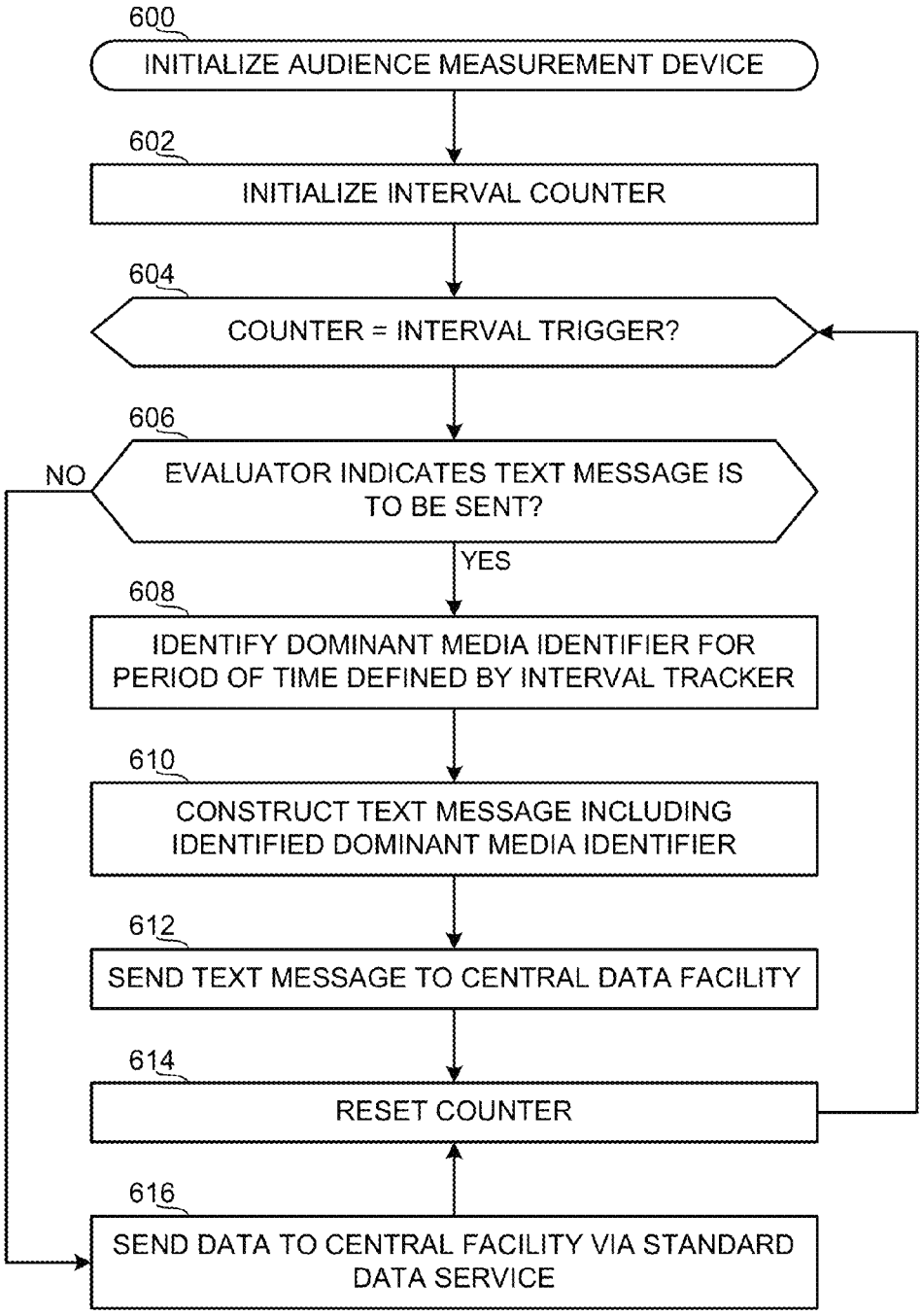
600
INITIALIZE AUDIENCE MEASUREMENT DEVICE
602
INITIALIZE INTERVAL COUNTER
604
COUNTER = INTERVAL TRIGGER?
606
NO
EVALUATOR INDICATES TEXT MESSAGE IS TO BE SENT?
YES
608
IDENTIFY DOMINANT MEDIA IDENTIFIER FOR PERIOD OF TIME DEFINED BY INTERVAL TRACKER
610
CONSTRUCT TEXT MESSAGE INCLUDING IDENTIFIED DOMINANT MEDIA IDENTIFIER
612
SEND TEXT MESSAGE TO CENTRAL DATA FACILITY
614
RESET COUNTER
616
SEND DATA TO CENTRAL FACILITY VIA STANDARD DATA SERVICE

FIG. 6

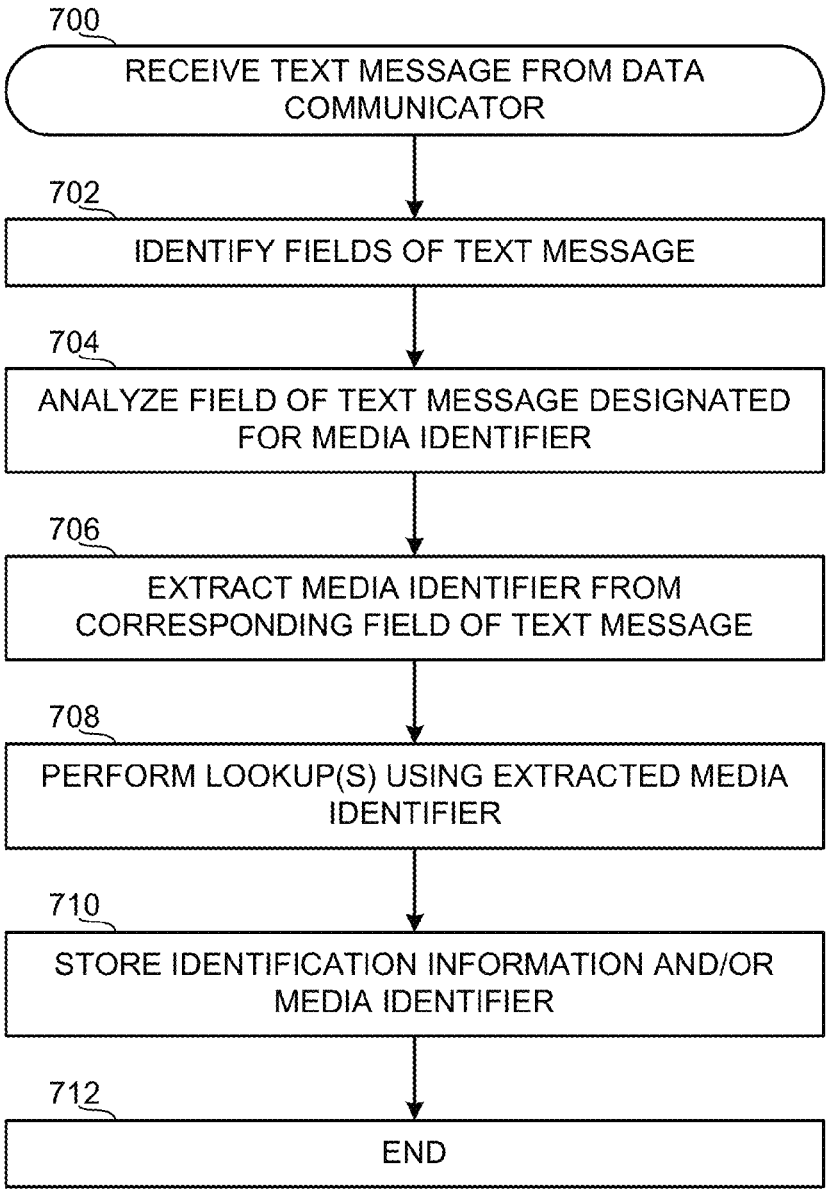
700
RECEIVE TEXT MESSAGE FROM DATA COMMUNICATOR
702
IDENTIFY FIELDS OF TEXT MESSAGE
704
ANALYZE FIELD OF TEXT MESSAGE DESIGNATED FOR MEDIA IDENTIFIER
706
EXTRACT MEDIA IDENTIFIER FROM CORRESPONDING FIELD OF TEXT MESSAGE
708
PERFORM LOOKUP(S) USING EXTRACTED MEDIA IDENTIFIER
710
STORE IDENTIFICATION INFORMATION AND/OR MEDIA IDENTIFIER
712
END

FIG. 7

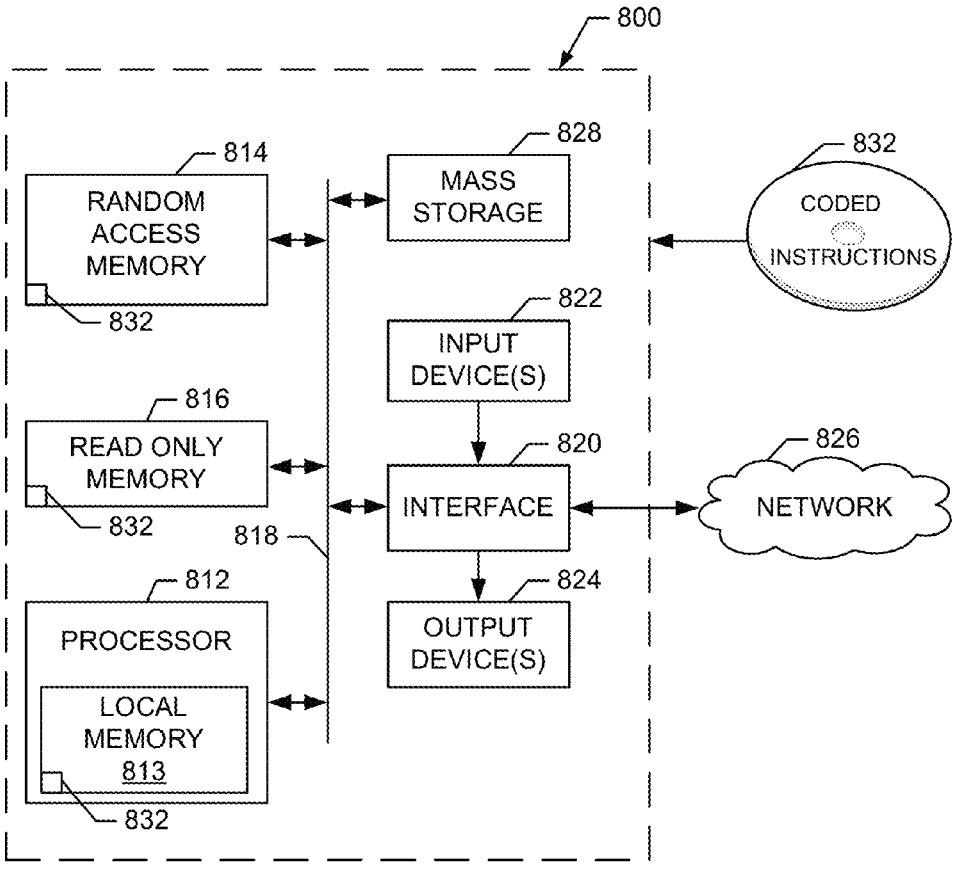
800
814
RANDOM ACCESS MEMORY
832
828
MASS STORAGE
832
CODED INSTRUCTIONS
822
INPUT DEVICE(S)
816
READ ONLY MEMORY
832
820
826
INTERFACE
NETWORK
818
812
PROCESSOR
LOCAL MEMORY 813
832
824
OUTPUT DEVICE(S)

FIG. 8

METHODS AND APPARATUS TO COMMUNICATE AUDIENCE MEASUREMENT INFORMATION

FIELD OF THE DISCLOSURE

This disclosure relates generally to audience measurement and, more particularly, to methods and apparatus to communicate audience measurement information.

BACKGROUND

Audience measurement of media (e.g., movies, television and/or radio (broadcast, multicast, pay-per-view, Internet protocol television (IPTV), satellite, terrestrial, streamed, etc.), stored audio and/or video media played back from a memory such as a digital video recorder or a digital video disc, audio and/or video media played via the Internet, video games, etc.) often involves collection of media identifying data (e.g., signature(s), fingerprint(s), identification code(s), channel information, time of consumption information, etc.) indicative of media presented at, for example, certain locations (e.g., statistically selected households) and/or in connection with certain individuals (e.g., statistically selected people). In some instances, an entity collecting the media identifying data is also aware of one or more characteristics (e.g., demographics) of the locations and/or individuals (e.g., panelists) to which the identified media was presented. Used in combination with the known characteristic(s), the media identifying data provides information related to media exposure and/or consumption indicative of amount(s) and/or type(s) of people that were exposed to identified piece(s) of media.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an illustration of an example communication system including an example audience measurement device constructed in accordance with teachings of this disclosure.

FIG. **2** is a block diagram of an example implementation of the example audience measurement device of FIG. **1** and the example central facility of FIG. **1**.

FIG. **3** is a block diagram of an example implementation of the example data communicator of FIG. **2**.

FIG. **4** is an illustration of an example text message format utilized by the example data communicator of FIG. **2**.

FIG. **5** is a block diagram of an example implement of the example central facility of FIGS. **1** and/or **2**.

FIG. **6** is a flowchart illustrating example machine readable instructions that may be executed to implement the example data communicator of FIGS. **2** and/or **3**.

FIG. **7** is a flowchart illustrating example machine readable instructions that may be executed to implement the example central facility of FIGS. **1** and/or **2**.

FIG. **8** is a block diagram of an example processing system capable of executing the example machine readable instructions of FIG. **6** to implement the example audience measurement device of FIGS. **1**, **2** and/or **3** and/or the example machine readable instructions of FIG. **7** to implement the example central facility of FIGS. **1**, **2** and/or **5**.

DETAILED DESCRIPTION

Audience measurement entities generate statistics that enable clients such as advertisers, media strategists, product manufacturers, etc. to target one or more demographics, populations, and/or markets. Additionally or alternatively, the clients of audience measurement entities use audience measurement statistics (e.g., ratings) to evaluate performance of media across one or more demographics and/or markets. In many instances, clients are interesting in having as much data as possible related to many demographics, populations, and/or markets. Therefore, audience measurement entities benefit from an ability to collect media exposure and/or consumption data across wide ranges of demographics, populations, and/or markets.

There are challenges in collecting sufficient amounts of accurate data to generate robust statistics from some demographics, populations, and/or markets. For example, after data is gathered at a collection site (e.g., in a living room of a house or on a portable device carried by a person), the data is typically delivered to a central facility for storage and/or analysis. For some data collection sites, such as households in major United States metropolitan areas, electronic delivery of the collected data is straightforward. For example, an in-home audience measurement device deployed in a large city has access to a readily available communication infrastructure, such as a Wide Area Network (WAN) that provides consistent quality of service. Such an audience measurement device can utilize the communication infrastructure (e.g., the Internet) to send data over communication channels having large amounts of bandwidth to frequently convey data to the central facility at any desired time of day.

On the other hand, effective and reliable electronic delivery of data to the central facility can be difficult from, for example, a data collection site located in an emerging market, a developing nation, and/or a rural geographic location having less of a communication infrastructure than, for example, a major metropolitan area in the United States. For example, in some geographic locations, reliable access to a network such as the Internet is not available, not reliably available (e.g., experiences frequent service interruptions), and/or does not provide a high enough quality of service (e.g., bandwidth) to form a basis of a plan to regularly convey data to the central facility. When a reliable wired network connection is not available to convey data to the central facility, some collection devices rely on a cellular component (e.g., modem) to communicate the collected data over a cellular network. However, using cellular components to convey audience measurement data has drawbacks. For example, some geographic locations (e.g., emerging markets, developing nations, etc.) lack a reliable cellular infrastructure and, thus, delivery of data via cellular data service is not robust or reliable enough for sending large amounts of data at frequent intervals. In some instances and/or locations, the cellular infrastructure is limited to supporting voice data and/or small amounts of text data (e.g., short messaging service (SMS)) and, thus, is incapable of sending large amounts of data over the cellular network. Moreover, cellular data services are often expensive, especially for audience measurement devices that frequently convey large amounts of data on a regular basis.

For these and other reasons, audience measurement entities have found it difficult to electronically collect audience measurement information from certain geographic locations, markets, and/or populations. Without an ability to deploy and/or rely on electronic collection, audience measurement entities attempting to collect data from such challenging sites have sometimes relied on panels of participants to fill out logs or diaries indicative of the media to which the participants are exposed. Such logs are hand written and mailed to the central facility, where the diary information is entered into an electronic database. While proven as an effective technique to collect audience measurement data, the diaries have drawbacks compared to electronic meters that automatically collect media exposure and/or consumption information. For

example, some electronic meters passively record media exposure information rather than requiring active participation of the panelists. Additionally, electronic meters that require active participation of the panelists typically include a convenient user interface that is more user friendly than a paper diary. A collection device that makes data entry more convenient is more likely to result in compliance with reporting terms by the panelists. That is, electronic collection devices are more convenient to use and, thus, less likely to draw objections from potential and/or current participants, especially in emerging markets that may not be as familiar with audience measurement systems as other markets or populations. In other words, potential participants are typically more likely to agree to participant in (and/or remain in) a panel involving a convenient, passive collection device that only requires placement of the collection device in a room and/or carrying of the collection device. It has been found that active user participation, (e.g., logging in to a people meter to record a person presence in an audience) is a causal factor in individuals leaving panels. Reducing the inconvenience to panelists can be a large cost savings to audience measurement entities as it may increase the length of time persons participate in the panel and adding new persons to panels is costly. Moreover, accuracy of information provided via the manual diaries suffers from human error (e.g., writing down incorrect information, failure of memory, etc.). Accordingly, increasing the availability of electronic collection devices to potential participants for a panel is valuable to enhance the accuracy of the data.

Example methods, apparatus, and/or articles of manufacture disclosed herein enable deployment of electronic data collection devices in more populations and/or markets by improving communication capabilities of data collection devices. Examples disclosed herein provide a cost-effective, reliable technique of conveying audience measurement data from a collection site to, for example, a central facility. While examples disclosed herein can be deployed in any environment and/or in connection with any data collection device, some examples disclosed herein are particularly useful for collecting data in scenarios and/or geographic locations in which a wired network connection is unavailable and/or unreliable. Additionally, examples disclosed herein are particularly useful for collecting data in scenarios and/or geographic locations in which communicating audience measurement data via a cellular data service is insufficient (e.g., in terms of bandwidth), not cost-effective, unavailable, and/or unreliable. As a result of the improvements provided by examples disclosed herein to effectively communicate electronic data, the non-electronic collection devices (e.g., diaries) often utilized due to unavailability of reliable and/or cost-ineffective electronic communication channels can be replaced and/or supplemented with more convenient, and/or more accurate electronic collection devices.

Some examples disclosed herein utilize inexpensive plans and transmission protocols offered by cellular service providers to communicate audience measurement information, as opposed to the standard cellular data service plans used by previous systems. Providers of cellular service (e.g., proprietors of cellular networks) typically offer different plans for transmission of different types of data. Plans that enable users to send and receive data of any size to and from, for example, a web server to visit a website are referred to herein as data service plans or standard data service plans. The protocols utilized in the standard service plans (e.g., Long Term Evolution (LTE), code division multiple access (CDMA), Universal Mobile Telecommunications System (UMTS), 3G, 4G, etc.) enable transfer of large amounts of data in each packet or request. Transmission of data via standard data service plans can become expensive when large amounts of data are regularly transmitted. Previous audience measurement devices communicating over cellular networks utilized the standard data service plans to transmit audience measurement data to a central facility. The cost of doing so is a limiting factor that restricts the ability of audience measurement entities to reach geographic areas and/or markets that need to rely on cellular communication to transmit data (e.g., where wired network connections are not available).

Another type of plan and/or protocol offered by cellular service providers is a text-only plan that is limited to transmission of textual messages of a capped size. An example text-based messaging service is Short Messaging Service (SMS) in which text-only messages of a capped size (e.g., in terms of bytes) are conveyed from originating party to a destination party using a different protocol than the protocol used by the standard data service plan previously used to convey audience measurement data. Example methods, apparatus, and/or articles of manufacture disclosed herein recognize that transmission of the text-only messages via protocols like SMS is typically much less expensive than transmission of messages provided by standard data services. Additionally, example methods, apparatus, and/or articles of manufacture disclosed herein recognize that the text-only messages are more likely to be successfully transmitted over some cellular networks than messages using the protocols of standard data service plans. The higher likelihood is a result of several factors including, for example, the capped smaller size of the text-only messages and the lower complexity and/or bandwidth requirements of the protocols used to send the text-only messages relative to the standard data services. As described in detail below, examples disclosed herein take advantage of these benefits of text-only messages to more effectively and/or reliably deliver data to a central facility of an audience measurement entity, thereby enabling the audience measurement entity to cost effectively expand in or enter, for example, emerging markets having developing communication infrastructures.

FIG. **1** illustrates an example household **100** including an example audience measurement device **102** constructed in accordance with teachings disclosed herein. In the example of FIG. **1**, the household **100** receives media from one or more sources such as a cable provider **104**, a satellite **106**, and/or a web server **108**. Although multiple sources are shown in the example of FIG. **1**, any subset of the sources and/or different sources may additionally or alternatively be withheld. The example household **100** of FIG. **1** includes one or more media presentation devices that render data received from one or more of the media sources **104**-**108** and/or any other media source(s). In the illustrated example, the household **100** includes a television **110**, a personal computer **112**, and/or a portable device **114** (e.g., a smart phone or tablet), which is useable inside and/or outside of the household **100** to, for example, access media and/or place telephone calls. Although multiple media devices are shown in the example of FIG. **1**, any subset of the devices and/or alternative or additional devices may be present. The television **110** of the illustrated example receives television signals transmitted via a plurality of channels via the cable service **104** and/or the satellite **106**. The example personal computer **112** and the example portable device **114** of FIG. **1** download media (e.g., Internet protocol television (IPTV), on-demand movies, advertisements, web videos, streaming media, etc.) from one or more web servers, such as the web server **108**, via a network **116** (e.g., the Internet) and/or any other online or local (e.g., a DVD, hard drive, removable flash memory, SD card,

etc.) resource of media. Further, the example personal computer **112** and the example portable device **114** render the media on a display device, such as a monitor and/or speakers in communication with the personal computer **112** and/or the portable device **114**.

As described in detail below in connection with FIG. **2**, the example audience measurement device **102** of FIG. **1** collects data from, for example, one or more presentations generated by one or more of the media presentation devices **110-112** of FIG. **1**. Further, as described in detail below in connection with FIG. **2**, the example audience measurement device **102** actively and/or passively collects information related to people exposed to the media presentations being monitored by the example audience measurement device **102**. In the illustrated example, the audience measurement device **102** includes or is coupled to a camera **118**, in addition to other devices and methods, to capture images of people present in a media exposure environment, such as a living room of the household **100**. Data collected by the example audience measurement device **102** and/or via any other collection device of the example household **100** of FIG. **1** is conveyed to a central facility **120** associated with an audience measurement entity. The example central facility **122** of FIG. **1** includes a server **122** to analyze the received data and a database **124** to store the received data and/or results of the analyses performed by the server **122** and/or the audience measurement device **102** (e.g., the results of analyses performed at the device **102** before the collected data was conveyed to the central facility **120**).

While the example household **100** of FIG. **1** includes a wired network connection **126** that can be utilized to convey collected data to the central facility **120**, the example audience measurement device **102** is also in communication with one or more cellular access points (e.g., cellular towers) **128**. In some examples, such as geographic locations associated with emerging markets and/or developing nations, the wired network connection **126** is not available at the household **100**. The example cellular access point(s) **128** of FIG. **1** are communicatively coupled to the central facility **120** via one or more cellular networks and/or wired networks (e.g., the network **116**). Thus, the example audience measurement device **102** can convey data to, for example, the central facility **120** via the cellular access point(s) **128**.

FIG. **2** illustrates an example implementation of the example audience measurement device **102** of FIG. **1**. In some examples, the audience measurement device **102** is implemented as an electronic device that may be shipped to the household **100** (e.g., via governmental postal service, private courier, etc.) and easily installed by the viewer by, for example, placing the audience measurement device **102** in a media exposure environment, such as a living room. The example audience measurement device **102** of FIG. **2** includes an audience detector **200** and a content identifier **202**. The example audience detector **200** of FIG. **2** (also referred to as a people meter) includes a first image sensor **204** that may correspond to the example camera **118** of FIG. **1**. The example audience detector **200** of FIG. **2** also includes a people counter **206**, a time stamper **208**, and a memory **210**. The example image sensor **204** of FIG. **2** capture frames of image data of a media exposure environment of the example household **100** of FIG. **1**, which may include an audience being exposed to a presentation output by one or more of the media presentation devices **104-108** of FIG. **1**. In some examples, the image sensor **204** only captures frames of image data when at least one media presentation device, such as the television **110** is in an "on" state and/or when the content identifier **202** determines that media is being presented in the monitored environment. The image sensor **204** may be implemented as any suitable device such as, for example, an infrared imager or a digital camera, such as a charge-coupled device (CCD) camera or on XBOX KINECT. The frames of image data captured by the image sensor **204** are conveyed to the people counter **206**. In the illustrated example of FIG. **2**, the people counter **206** determines and records how many people are present in the monitored environment for a particular time using the received frames of image data. The example people counter **206** of FIG. **2** can utilize any suitable technique (e.g., blob counting, facial recognition, face detection, movement detection, etc.) to analyze the image data to generate people information (e.g., people counts, people identities, etc.). An example blob counting method is disclosed in U.S. Pat. No. 7,609,853, which is hereby incorporated by reference herein in its entirety.

In addition to or in lieu of the image data provided by the image sensor **204**, the example people counter **206** can gather information related to people of a monitored environment via wearable and/or stationary identification devices (e.g., radio frequency identification (RFID) cards), each associated with a member of the household **100**. The example people counter **206** can detect a presence of a wearable identification device and assume that the corresponding person is wearing the identification device. As such, the people counter **206** can determine that the corresponding person is in the monitored environment. Additionally or alternatively, the people counter **206** can receive inputs (e.g., selection (e.g., depression) of dedicated buttons) from member(s) of the household **100** to indicate that member(s) are in the monitored environment. Other techniques for detecting people and/or identities of people may additionally or alternatively be used in the example people counter **206** of FIG. **2**.

The example people counter **206** of FIG. **2** outputs calculated people information and/or the corresponding frames of image data to the time stamper **208**. The time stamper **208** of the illustrated example includes a clock and a calendar to time stamp information by, for example, appending a time stamp to an end of the people information and/or image data. In the example of FIG. **2**, the time stamped image data and/or people information is stored in the memory **210**. The memory **210** may include a volatile memory (e.g., Synchronous Dynamic Random Access Memory (SDRAM), Dynamic Random Access Memory (DRAM), RAMBUS Dynamic Random Access Memory (RDRAM, etc.) and/or a non-volatile memory (e.g., flash memory). The memory **210** may also include one or more mass storage devices such as, for example, hard drive disk(s), compact disk drive(s), digital versatile disk drive(s), etc.

In some examples, the audience measurement device **102** does not include any people metering functionality. In such examples, the image sensor **204** and/or the people counter **206** are omitted. In such instances, the example audience measurement device **102** acts as a media identifying information collection device but does not detect the presence of people in the monitored environment.

The example content identifier **202** of FIG. **2** includes a program detector **212** and a data communicator **214**. The example program detector **212** of FIG. **2** detects presentation(s) of media in the monitored environment and collects identification information associated with the detected presentation(s). The program detector **212** of the illustrated example, which may be in wired and/or wireless communication with one or more of the media presentation devices **104-108** of FIG. **1**, identifies a presentation time and a source of a media presentation. The presentation time and the source identification data may be utilized to identify the

media by, for example, cross-referencing a program guide configured as a look up table. The example program detector **212** obtains the source identification information (e.g., the identity of a channel) by, for example, monitoring a tuner or set-top box associated with the television **110** or a digital selection (e.g., a remote control signal) of a channel to be presented on the television **110**. Source identification data includes, for example, a broadcast channel identifier or an identifier associated with of a web site (e.g., a Universal Resource Locator) visited by a web browser of the personal computer **112**.

Additionally or alternatively, the example program detector **212** of FIG. **2** may collect codes embedded with or otherwise transmitted with media presented via the television **110** and/or personal computer **112** to identify media. As used herein, a code is an identifier that is transmitted with the media for the purpose of identifying the corresponding media. Codes may be carried in the audio, in the video, in the metadata, in the vertical blanking interval, or in any other portion of the media. Additionally or alternatively, the example program detector **212** of FIG. **2** may collect a signature representative of a portion of the media. As used herein, a signature is a representation of some characteristic of the media (e.g., a frequency spectrum of an audio signal) that can be compared against a collection of known signatures to identify the corresponding media. The example program detector **212** of FIG. **2** can generate the signature(s) and/or collect samples of the media and export the samples to a remote site (e.g., the central facility **120** of FIG. **1**) for generation of the signature(s). The example program detector **212** can utilize any additional or alternative mechanisms and/or techniques, such as watermarks embedded in the media and/or fingerprints of the media, to identify media presentation in a monitored environment. In the illustrated example, the identification information (e.g., source identification, code(s), signature(s), watermark(s), fingerprint(s), etc.) is time stamped by the time stamper **208** and stored in the memory **210**.

In the illustrated example of FIG. **2**, the data communicator **214** accesses the memory **210** to obtain and transmit the audience measurement information to the example central facility **120** of FIG. **1** and/or to any other site or device. As described in detail below in connection with FIGS. **3** and **4**, the example data communicator **214** expands capabilities of the audience measurement device **102** to conveniently, accurately and cost-effectively communicate the audience measurement information to, for example, the central facility **120**. For example, in addition to the ability to transfer data to the central facility **120** via a standard data service protocol that supports communication of large amounts of data, the example data communicator **214** provides the audience measurement device **102** with an ability to send audience measurement information via a text-only messaging protocol (e.g., SMS messaging). As described in detail below, the example data communicator **214** of FIG. **2** determines which of the protocols (e.g., the standard data service protocol or the text-only messaging protocol) to use for communication of, for example, audience measurement data to the central facility **120**.

The central facility **120** analyzes the audience measurement data to create, for example, statistics related to the identified media. For example, the amount of people (as counted by the people counter **206**) in the monitored exposure environment at a particular time (as indicated by a time stamp appended to people count by the time stamper **208**) in which a sporting event (as identified by the program detector **212**) was presented by the television **110** can be used in a rating calculation for the sporting event. The audience measurement data uploaded by the data communicator **214** may not identify the program specifically. Instead, in view of the reduced bandwidths utilized by the communication media (e.g., text messaging), the time and channel number or other identifier(s) may be uploaded which enables the central facility **120** to identify the program using, for example, a table mapping channels to programs based on time. In some examples, the central facility **120** correlates additional or alternative information (e.g., demographic data related to the household **100**, geographic data related to the household **100**, etc.) with the collected information to expand the usefulness of the data collected by the example audience measurement device **102** of FIGS. **1** and/or **2**. As described below in connection with FIGS.

While an example manner of implementing the audience measurement device **102** of FIG. **1** has been illustrated in FIG. **2**, one or more of the elements, processes and/or devices illustrated in FIG. **2** may be combined, divided, re-arranged, omitted, eliminated and/or implemented in any other way. Further, the example audience detector **200**, the example content identifier **202**, the example image sensor **204**, the example people counter **206**, the example time stamper **208**, the example program detector **212**, the example data communicator **214** and/or, more generally, the example audience measurement **102** of FIG. **2** may be implemented by hardware, software, firmware and/or any combination of hardware, software and/or firmware. Thus, for example, any of the example audience detector **200**, the example content identifier **202**, the example image sensor **204**, the example people counter **206**, the example time stamper **208**, the example program detector **212**, the example data communicator **214** and/or, more generally, the example audience measurement **102** of FIG. **2** could be implemented by one or more circuit(s), programmable processor(s), application specific integrated circuit(s) (ASIC(s)), programmable logic device(s) (PLD(s)) and/or field programmable logic device(s) (FPLD(s)), etc. When any of the apparatus or system claims of this patent are read to cover a purely software and/or firmware implementation, at least one of the example audience detector **200**, the example content identifier **202**, the example image sensor **204**, the example people counter **206**, the example time stamper **208**, the example program detector **212**, the example data communicator **214** and/or, more generally, the example audience measurement **102** of FIG. **2** are hereby expressly defined to include a tangible computer readable medium such as a memory, DVD, CD, Blu-ray, etc. storing the software and/or firmware. Further still, the example audience measurement device **102** of FIG. **2** may include one or more elements, processes and/or devices in addition to, or instead of, those illustrated in FIG. **2**, and/or may include more than one of any or all of the illustrated elements, processes and devices.

FIG. **3** is a block diagram of an example implementation of the example data communicator **214** of FIG. **2**. The example data communicator **214** of FIG. **3** is tasked with communicating data collected by the audience measurement device **102** to, for example, the central facility **120** of FIG. **1**. Unlike previous audience measurement devices that relied strictly on standard data service protocols offered by cellular service providers to transmit collected data over a cellular network, the example data communicator **214** (in addition to or in lieu of the standard data service protocols) transmits collected data using a text-only protocol offered by cellular service providers at a much lower cost and with a higher rate of successful delivery. In particular, the example data communicator **214** of FIG. **3** incorporates data collected by the audience measurement device **102** into a text message for trans-

mission via a text-only protocol, such as SMS, to the central facility **120**. As described in detail below in connection with FIGS. **5** and **7**, the central facility **120** is capable of receiving, parsing and interpreting such text messages. In some examples, an entity associated with the audience measurement device **102** (e.g., operators of the example central facility **120**) purchases unlimited text messaging plans at rates much lower than the cost of standard data service plans, which often include charges per byte of data.

In the illustrated example of FIG. **3**, the data communicator **314** communicates audience measurement data (e.g., people count(s) and/or media identifying information such as source identifier(s), signature(s), watermark(s), code(s), etc.) for defined periods of time over which the audience measurement data was detected. For example, the data communicator **214** of FIG. **3** conveys a first communication including audience measurement data that was collected over a first fifteen (15) minute period of time, and a second communication including audience measurement data that was collected over a second fifteen (15) minute period of time. The example data communicator **214** can use any suitable period of time corresponding to, for example, granularity requirements and/or cost concerns. To enable a user (e.g., an administrator associated with the entity operating the central facility **120**) to define or set the period of time, the example data communicator **214** includes an interval tracker **300**. The example interval tracker **300** of FIG. **3** maintains a clock and/or counter to define the period of time for the data communicator **214**. When a defined period of time has elapsed according to the clock or counter, the example interval tracker **300** triggers operations of the data communicator **214** described in detail below. The clock and/or counter maintained by the example interval tracker **300** can be adjusted to alter the length of the periods of time for which collected data is transmitted.

In the illustrated example of FIG. **3**, the audience measurement device **102** in which the data communicator **214** is implemented includes the ability to transmit messages via a cellular component according to first and second different protocols. The first protocol via which the data communicator **214** can communicate data corresponds to a standard data service offered by a cellular service provider. The standard data service (e.g., CDMA, LTE, (UMTS), 3G, 4G, etc.) enables the data communicator **214** to transmit and receive large amounts of data, such as web pages, audio, video, electronic mail messages, etc. of any suitable size. In contrast, the second protocol via which the data communicator **214** can communicate corresponds to a text-only messaging service. The text-only messaging service (e.g., SMS) enables the data communicator **214** to transmit and receive messages including only textual characters and of a capped size (e.g., in terms of bytes or number of characters), such as one hundred forty (140) bytes or one hundred sixty (160) characters.

To determine which one of the first and second protocols via which the data communicator **214** is to communicate information at a given time, the example data communicator **214** includes a communication service evaluator **302**. In the illustrated example, the data communicator **214** indicates whether the first or second protocol should be used depending on an evaluation of one or more conditions associated with the first protocol and/or second protocol (and/or additional or alternative protocols utilized by the data communicator **214**). Example conditions evaluated by the communication service evaluator **302** include a schedule (e.g., based on time of day which may be selected based on rate charges per time of day), an availability of the first protocol (e.g., the standard data service), a reliability (e.g., likelihood of successfully delivering data) of the first protocol, etc. For example, the communication service evaluator **302** may test the standard data service to determine whether use of the standard data service is likely (e.g., beyond a threshold percentage) to be successful in delivering message(s) (e.g., based on signal strength). If the standard data service is unlikely to successfully deliver message(s) at a given time (e.g., the audience measurement is not in a coverage area of the standard data service protocol, the signal strength is less than a threshold, such as a certain percentage of the maximum expected signal strength, etc.), if a schedule indicates that the standard data service is not to be used (e.g., due to costs), and/or the standard data service is not be used for any other suitable reason, the example communication service evaluator **302** indicates that the second protocol (e.g., the text-only messaging service) is to be used to communicate the data. In other words, the example communication service evaluator **302** of FIG. **3** evaluates one or more conditions associated with the standard data service and indicates that the text-only messaging service is to be used when the evaluated conditions meet one or more criteria (e.g., weak signal strength, unavailability, etc.).

The example communication service evaluator **302** conveys an output or instruction (e.g., a decision between the first and second protocol) to a switcher **303**. The example switcher **303** of FIG. **3** tracks a current protocol that is currently used by the example data communicator **214** to transmit audience measurement information to the central facility **120**. If the protocol selected by the communication service evaluator **302** differs from the current protocol, the example switcher **303** changes the current protocol that the data communicator **214** uses to communicate audience measurement data to the central facility **120**. Otherwise, the example switcher **303** of FIG. **3** does not switch the protocol. Thus, the example switcher **303** of FIG. **3** implements the decision made by the example communication service evaluator **302** regarding which protocol (e.g., a standard data service protocol or a text-only messaging protocol) is to be used to communicate particular audience measurement data.

In some examples, the audience measurement device **102** in which the data communicator **214** is implemented does not have the standard data service available (e.g., the corresponding data plan has not been purchased and/or otherwise enabled). In such instances, the example communication service evaluator **302** and/or the example switcher **303** may be omitted or continuously set to indicate that the text-only messaging service is to be used to communicate data. In some examples, the communication service evaluator **302** and/or the example switcher **303** may choose from additional or alternative protocols (e.g., Wi-Fi, Ethernet, etc.) to communicate audience measurement data and/or other types of data.

The example data communicator **214** of FIG. **3** also includes a dominant data identifier **304** to determine which piece of media identifying information (referred to herein as a media identifier) was most frequently detected during the corresponding period of time (e.g., the first or second fifteen (15) minute period of time of the above example). As described above in connection with FIG. **2**, the program detector **212** detects media identifiers (e.g., channel numbers, program names, codes, signatures, metadata, etc.) of media (e.g., content and/or advertisements) presented at a monitored collection site. Further, as described above in connection with FIG. **2**, the program detector **212** stores the detected media identifiers in the memory **210** in conjunction with time stamps. To identify which of the media identifier(s) detected during a particular period of time was most frequently detected, the example dominant data identifier **304** accesses the portion(s) of the memory **210** corresponding to that particular period of time. In the illustrated example, the interval

tracker **300** triggers the dominant data identifier **304** to access the memory **210** after the defined period of time has expired and/or been reached.

The dominant media identifier is the channel number, code, signature, watermark, source identifier (e.g., broadcast station, URL, device identifier (e.g., Bluray player), etc.), or other data collected most often during the period of time defined by the example interval tracker **300**. Thus, to identify the dominant media identifier, the example dominant data identifier **304** accesses the memory **210** by submitting a query having parameters relatable to the time stamps stored in connection with the collected media identifying data. The example dominant data identifier **304** of FIG. **3** counts how many times each of the obtained media identifiers was collected during the first period of time. The example dominant data identifier **304** of the illustrated example determines which of the counts is the highest and marks and/stores the corresponding media identifier as the dominant one for the corresponding period of time. Thus, the example dominant data identifier **304** of FIG. **3** identifies a particular piece of media that was detected by the audience measurement device **102** more than any other piece of media during periods of time defined by the interval tracker **300**.

In the illustrated example of FIG. **3**, when the text-only messaging service is to be used to communicate data, the example data communicator **214** utilizes the dominant media identifier to adhere to the capped size enforced by the text messaging protocol. In particular, the example data communicator **214** generates a text message via a text message constructor **306** including the dominant media identifier as calculated by the dominant data identifier **304**. That is, for a particular collection period of time (e.g., the previous fifteen (15) minutes), the example text message constructor **306** obtains the dominant media identifier and incorporates the media identifier into a text message that represents the particular collection period of time. Thus, the example text message constructor **306** generates a text message having information indicative of which piece of media was watched most frequently during the particular period of time. In the illustrated example of FIG. **3**, the text message constructor **306** omits the non-dominant media identifiers (e.g., media identifiers detected less frequently than the dominant media identifier) collected over the period of time from the text message, thereby significantly reducing the amount of data in the text message. The example text message constructor **306** of FIG. **3** can include additional information in the text message such as, for example, the time stamp associated with the dominant media identifier and/or a people count associated with the dominant media identifier. In some examples, the text message constructor **306** utilizes a template and/or one or more fields to generate the text message according to an expected format. Although a less granular amount of media measurement data is sent via the text-only messaging than via the standard data service protocol, the less granular data is better than having no data which would be the result in many situations due to the cost and/or unreliability of the standard data service.

One such example format is shown in FIG. **4** that includes a plurality of fields designated for particular types of information. The example format of FIG. **4** includes a first field **400** of a first number of characters or bytes designated to include the identified dominant media identifier for a corresponding period of time. The example format of FIG. **4** includes a second field **402** of a second number of characters or bytes designated to include the period of time corresponding to the dominant media identifier. The example format of FIG. **4** includes a third field **404** of a third number of characters or bytes designated to include a people count. The example format of FIG. **4** includes a fourth field **406** of a fourth number of characters or bytes designated to include identification information associated with the example household **100** of FIG. **1**. The example format of FIG. **4** includes a fifth field **408** designated to include miscellaneous information. Additional or alternative formats, fields, numbers of characters or bytes, and/or types of information can be utilized by the example data communicator **214** of FIGS. **1** and/or **2**.

A device (e.g., a message parser) associated with the central facility **120** recognizes which portion(s) or field(s) of the text message are to include, for example, the dominant media identifier, which portion(s) or field(s) of the text message are to include the time stamp, which portion(s) or field(s) of the text message are to include the people count, etc. An example message parser of the example central facility **120** of FIGS. **1** and/or **2** is described below in connection with FIGS. **5** and **7**.

The example data communicator **214** of FIG. **3** includes an encrypter **308** to encrypt one or more aspects or portions of the text messages generated by the text message constructor **306**. In such instances, the example central facility **120** has access to an encryption key (e.g., a public key of a public-private key pair) and/or other mechanism capable of decrypting the encrypted text messages.

The example data communicator **214** of FIG. **3** includes an interface **310** to communicate the audience measurement data to, for example, the central facility **120**. The example interface **310** includes a modem and/or the cellular component to transmit and receive messages via a standard data service protocol and/or the text-only messaging service protocol described above. The example interface **310** receives instruction(s) from the example switcher **303** regarding which protocol is to be used to communicate audience measurement information. In some instances, when the standard data service protocol is to be used to communicate data (e.g., when the standard data service is available and/or scheduled for use), the example interface **310** facilitates communication of audience measurement data via the standard data service. The audience measurement data communicated via the standard data service protocol can include the dominant media identifier of the corresponding time and/or all of the media identifiers collected during the corresponding time.

Alternatively, when the text-only messaging service protocol is to be used to communicate data (e.g., when the standard data service is unavailable and/or when the text-only messaging service is scheduled for use), the example interface **310** facilitates communication of audience measurement data via the text-only message service. The audience measurement data communicated via the text-only messaging service protocol includes the dominant media identifier for the corresponding period of time, the corresponding time stamp, and/or the corresponding people count. In some examples, the data communicator **214** only sends audience measurement data via the text-only messaging service and does not utilize a standard data service plan.

FIG. **5** is a block diagram of an example implementation of the example central facility of FIGS. **1** and/or **2**. To process text messages received from the data communicator **214** of FIGS. **2** and/or **3**, the example central facility **120** of FIG. **5** includes a text message parser **500**. The example text message parser **500** includes a field identifier **502** to determine which portion of received text message correspond to which type of audience measurement information. In some examples, the data communicator **214** and the field identifier **502** exchange information regarding the field designations used by the text message constructor **306** to generate the text message to be

conveyed via the text-only messaging service. In such instances, the example field identifier **502** stores and uses the designation information to identify the different fields of received text messages. For example, the field identifier **502** stores an indication that the first field **400** of FIG. **4** corresponds to a dominant media identifier and that the second field **402** of FIG. **4** corresponds to a time stamp or period of time associated with the dominant media identifier of the first field **400**.

The example field identifier **502** conveys the field identification information to an example extractor **504** of the example text message parser **500**. The example extractor **504** analyzes the fields identified in the received information to determine, for example, whether the fields include valid data (e.g., data corresponding to the expected format). Further, the example extractor **504** extracts the information from the fields (e.g., when the data is determined to be valid). For example, the extractor **504** extracts a media identifier from the first field **400** of FIG. **4** and recognizes that the extracted media identifier is a dominant one collected over a period of time. Further, the example extractor **504** recognizes extracts the time stamp information from the second field of FIG. **4** and recognizes that the time stamp information is associated with the period of time for which the extracted media identifier was dominant (e.g., the most frequently detected identifier).

The example extractor **504** of FIG. **5** conveys the extracted data to the example server **122** of FIG. **1** for further analysis and/or the example database **124** of FIG. **1** for storage. In some examples, the extractor **504** additionally or alternatively conveys the extracted information to a translator **506** of the central facility **120**. The example translator **506** of FIG. **5** translates the extracted media identifier into more specific source identification information than the media identifier itself. For example, the dominant media identifier extracted from the text message may include a channel number and a time stamp. In such instances, the example translator **506** of FIG. **5** performs a lookup in one or more lookup tables **508** to determine which program was presented on the identified channel at a time corresponding to the time stamp. As a result, the example text message utilized by the example data communicator **214** to communicate audience measurement data can adhere to bandwidth restrictions by including smaller data in, for example, the first field **400** of the text message with the expectation that the central facility **120** is to be able to translate the smaller data into specific source information. Additional or alternative types of translation, such as signature, watermark, and/or identification code translation(s) are provided by the example translator **506** of FIG. **5**.

While an example manner of implementing the data communicator **214** of FIG. **2** has been illustrated in FIG. **3**, one or more of the elements, processes and/or devices illustrated in FIG. **3** may be combined, divided, re-arranged, omitted, eliminated and/or implemented in any other way. Further, the example interval tracker **300**, the example communication service evaluator **302**, the example switcher **303**, the example dominant data identifier **304**, the example text message constructor **306**, the example encrypter **308**, the example interface **310** and/or, more generally, the example data communicator **214** of FIG. **3** may be implemented by hardware, software, firmware and/or any combination of hardware, software and/or firmware. Thus, for example, any of the example interval tracker **300**, the example communication service evaluator **302**, the example switcher **303**, the example dominant data identifier **304**, the example text message constructor **306**, the example encrypter **308**, the example interface **310** and/or, more generally, the example data communicator **214** of FIG. **3** could be implemented by one or more circuit(s), programmable processor(s), application specific integrated circuit(s) (ASIC(s)), programmable logic device(s) (PLD(s)) and/or field programmable logic device(s) (FPLD(s)), etc. When any of the apparatus or system claims of this patent are read to cover a purely software and/or firmware implementation, at least one of the example interval tracker **300**, the example communication service evaluator **302**, the example switcher **303**, the example dominant data identifier **304**, the example text message constructor **306**, the example encrypter **308**, the example interface **310** and/or, more generally, the example data communicator **214** of FIG. **3** are hereby expressly defined to include a tangible computer readable medium such as a memory, DVD, CD, Blu-ray, etc. storing the software and/or firmware. Further still, the example data communication **214** of FIG. **3** may include one or more elements, processes and/or devices in addition to, or instead of, those illustrated in FIG. **3**, and/or may include more than one of any or all of the illustrated elements, processes and devices.

While an example manner of implementing the central facility **120** of FIGS. **1** and/or **2** has been illustrated in FIG. **5**, one or more of the elements, processes and/or devices illustrated in FIG. **5** may be combined, divided, re-arranged, omitted, eliminated and/or implemented in any other way. Further, the example text message parser **500**, the example field identifier **502**, the example extractor **504**, the example translator **506**, and/or, more generally, the example central facility **120** of FIG. **5** may be implemented by hardware, software, firmware and/or any combination of hardware, software and/or firmware. Thus, for example, any of the example text message parser **500**, the example field identifier **502**, the example extractor **504**, the example translator **506**, and/or, more generally, the example central facility **120** of FIG. **5** could be implemented by one or more circuit(s), programmable processor(s), application specific integrated circuit(s) (ASIC(s)), programmable logic device(s) (PLD(s)) and/or field programmable logic device(s) (FPLD(s)), etc. When any of the apparatus or system claims of this patent are read to cover a purely software and/or firmware implementation, at least one of the example text message parser **500**, the example field identifier **502**, the example extractor **504**, the example translator **506**, and/or, more generally, the example central facility **120** of FIG. **5** are hereby expressly defined to include a tangible computer readable medium such as a memory, DVD, CD, Blu-ray, etc. storing the software and/or firmware. Further still, the example central facility **120** of FIG. **5** may include one or more elements, processes and/or devices in addition to, or instead of, those illustrated in FIG. **5**, and/or may include more than one of any or all of the illustrated elements, processes and devices.

A flowchart representative of example machine readable instructions for implementing the data communicator **214** of FIGS. **2** and/or **3** is shown in FIG. **6**. A flowchart representative of example machine readable instructions for implementing the central facility of FIGS. **1**, **2** and/or **5** is shown in FIG. **7**. In these examples, the machine readable instructions comprise programs for execution by a processor such as the processor **812** shown in the example processor platform **800** discussed below in connection with FIG. **8**. The programs may be embodied in software stored on a tangible computer readable medium such as a CD-ROM, a floppy disk, a hard drive, a digital versatile disk (DVD), a Blu-ray disk, or a memory associated with the processor **812**, but the entire programs and/or parts thereof could alternatively be executed by a device other than the processor **812** and/or embodied in firmware or dedicated hardware. Further, although the example programs are described with reference to the flowcharts illustrated in FIGS. **6** and **7**, many other methods of

implementing the example data communicator **214** and/or the example central facility may alternatively be used. For example, the order of execution of the blocks may be changed, and/or some of the blocks described may be changed, eliminated, or combined.

As mentioned above, the example processes of FIGS. **6** and/or **7** may be implemented using coded instructions (e.g., computer readable instructions) stored on a tangible computer readable medium such as a hard disk drive, a flash memory, a read-only memory (ROM), a compact disk (CD), a digital versatile disk (DVD), a cache, a random-access memory (RAM) and/or any other storage media in which information is stored for any duration (e.g., for extended time periods, permanently, brief instances, for temporarily buffering, and/or for caching of the information). As used herein, the term tangible computer readable medium is expressly defined to include any type of computer readable storage and to exclude propagating signals. Additionally or alternatively, the example processes of FIGS. **6** and/or **7** may be implemented using coded instructions (e.g., computer readable instructions) stored on a non-transitory computer readable medium such as a hard disk drive, a flash memory, a read-only memory, a compact disk, a digital versatile disk, a cache, a random-access memory and/or any other storage media in which information is stored for any duration (e.g., for extended time periods, permanently, brief instances, for temporarily buffering, and/or for caching of the information). As used herein, the term non-transitory computer readable medium is expressly defined to include any type of computer readable medium and to exclude propagating signals. As used herein, when the phrase "at least" is used as the transition term in a preamble of a claim, it is open-ended in the same manner as the term "comprising" is open ended. Thus, a claim using "at least" as the transition term in its preamble may include elements in addition to those expressly recited in the claim.

The example of FIG. **6** begins with an initiation of the example audience measurement device **102** of FIGS. **1** and/or **2** (block **600**). As described in connection with FIG. **2**, the example audience measurement device collects media identifying information and/or people counts associated with a monitored environment (e.g., a living room of the example household **100** of FIG. **1**). In addition to the collection of audience measurement information, the example audience measurement device **102** conveys the collected device to, for example, the central facility **120** of FIGS. **1**, **2** and/or **5**. In the example of FIG. **6**, the audience measurement data collected during defined periods of time (or a summary thereof) is transmitted to the central facility **120** via the example data communicator **214** of FIGS. **2** and/or **3**.

To enforce the defined periods of time for which the collected audience measurement device is conveyed, the example interval tracker **300** maintains information related to periods of time in connection with the collection of the data. In the example of FIG. **6**, the interval tracker **300** is initialized in conjunction with the initialization of the audience measurement device **102** (block **602**). When the clock or counter of the interval tracker **300** has reached a trigger (e.g., the defined period of time has expired) (block **604**), the example data communicator **214** determines which communication protocol the data communicator **214** is to use for transmission of the collected audience measurement data (block **606**). In the illustrated example, the communication service evaluator **302** determines whether a standard data service protocol or a text-only messaging service protocol is to be used to communicate the collected information. If the communication service evaluator **302** indicates that the standard data service protocol is to be used (block **606**), the example switch **303** facilitates the communication (e.g., via the interface **310**) of collected audience measurement data (e.g., as stored at the memory **210** of FIG. **2**) to the central facility **120** via the standard data service protocol (block **616**).

If the communication service evaluator **302** indicates that the text-only messaging service protocol is to be used to communicate the audience measurement data (block **606**), the example dominant data identifier **304** accesses the memory **210** to obtain the media identifying information collected over the corresponding period of time (block **608**). The example dominant data identifier **304** counts how many times each of the obtained media identifiers was detected during the corresponding period of time (block **608**). The example dominant data identifier **304** determines that the media identifier having the greatest count corresponds to most frequently viewed piece of media during the period of time. Although a less granular amount of media measurement data is sent via the text-only messaging than via the standard data service protocol, the less granular data is better than having no data which would be the result in many situations due to the cost and/or unreliability of the standard data service.

The example text message constructor **306** generates a text message and incorporates the dominant media identifier in the text message (block **610**). The example text message constructor **306** may incorporate additional or alternative audience measurement data such as, for example, the corresponding time stamp(s), the corresponding people count, an identifier of the household **100**, etc. When the text message has been constructed, the example switch **303** facilitates communication (e.g., via the interface **310**) of the text message to the central facility **120** (block **612**). The counter maintained by the example interval tracker **300** is reset and control returns block **604**.

FIG. **7** begins with the example central facility of FIGS. **1**, **2** and/or **5** receiving a text message from the example data communicator **214** of FIGS. **2** and/or **3** (block **700**). The example central facility **120** of FIG. **5** includes the text message parser **500** to process such text message and the translator **506** to interpret data extracted from the text message by the text message parser **500**. As the received text message includes a plurality of fields, such as the fields **400**-**406** of FIG. **4**, each designating for a particular type of information, the example field identifier **502** of the text message parser **500** identifies which portions of the received text message corresponds to which types of information (block **702**). In the illustrated example, the extractor **504** of the text message parser **500** analyzes the identified fields of the received text message to determine, for example, whether the field include valid data (e.g., data conforming to an expected format) (block **704**). The example extractor **504** extracts data from one or more of the fields **400**-**406** of the received text message. In the illustrated example of FIG. **7**, the extractor **504** extracts the media identifier from the corresponding one of the fields (e.g., the first field **400** of FIG. **4**) (block **706**). Additional or alternative types of information can be extracted from additional or alternative ones of the fields.

The example translator **506** uses the extracted information to perform one or more translations. In the illustrated example, the translation(s) performed by the translator **506** include lookup(s) in the lookup table(s) **508** to determine, for example, source information associated with the extracted media identifier (block **708**). The source information developed from the extracted media identifier is indicative of, for example, a program broadcast on a particular channel, a movie, a video game, a song, a stream presented on a web page, etc. The source identification information, the extracted

media identifier, and/or any additional or alternative information extracted and/or developed from the received text message is stored at the central facility **120** (block **710**). The example of FIG. **7** then ends (block **712**).

FIG. **8** is a block diagram of an example processor platform **800** capable of executing the instructions of FIG. **6** to implement the data communicator **214** of FIGS. **2** and/or **3** and/or the instructions of FIG. **7** to implement the central facility **120** of FIGS. **1**, **2**, and/or **5**. The processor platform **800** can be, for example, a personal computer, a mobile phone (e.g., a cell phone), a personal digital assistant (PDA), an Internet appliance, a DVD player, a CD player, a digital video recorder, a Blu-ray player, a gaming console, a personal video recorder, a set top box, or any other type of computing device.

The processor platform **800** of the instant example includes a processor **812**. For example, the processor **812** can be implemented by one or more microprocessors or controllers from any desired family or manufacturer.

The processor **812** includes a local memory **813** (e.g., a cache) and is in communication with a main memory including a volatile memory **814** and a non-volatile memory **816** via a bus **818**. The volatile memory **814** may be implemented by Synchronous Dynamic Random Access Memory (SDRAM), Dynamic Random Access Memory (DRAM), RAMBUS Dynamic Random Access Memory (RDRAM) and/or any other type of random access memory device. The non-volatile memory **1016** may be implemented by flash memory and/or any other desired type of memory device. Access to the main memory **814**, **816** is controlled by a memory controller.

The processor platform **800** also includes an interface circuit **820**. The interface circuit **820** may be implemented by any type of interface standard, such as an Ethernet interface, a universal serial bus (USB), and/or a PCI express interface.

One or more input devices **822** are connected to the interface circuit **820**. The input device(s) **822** permit a user to enter data and commands into the processor **812**. The input device(s) can be implemented by, for example, a keyboard, a mouse, a touchscreen, a track-pad, a trackball, isopoint and/or a voice recognition system.

One or more output devices **824** are also connected to the interface circuit **820**. The output devices **1024** can be implemented, for example, by display devices (e.g., a liquid crystal display, a cathode ray tube display (CRT), a printer and/or speakers). The interface circuit **820**, thus, typically includes a graphics driver card.

The interface circuit **820** also includes a communication device (e.g., the interface **310** of FIG. **3**) such as a modem or network interface card to facilitate exchange of data with external computers via a network **826** (e.g., an Ethernet connection, a digital subscriber line (DSL), a telephone line, coaxial cable, a cellular telephone system, etc.).

The processor platform **800** also includes one or more mass storage devices **828** for storing software and data. Examples of such mass storage devices **828** include floppy disk drives, hard drive disks, compact disk drives and digital versatile disk (DVD) drives. The mass storage device **828** may implement the memory **210** of FIG. **2**.

Coded instructions **832** (e.g., the machine readable instructions represented in FIGS. **6** and/or **7**) may be stored in the mass storage device **828**, in the volatile memory **814**, in the non-volatile memory **816**, and/or on a removable storage medium such as a CD or DVD.

An example method includes analyzing, via a processor, a plurality of media identifiers collected over a first period of time to identify a dominant one of the media identifiers for the first period of time; and communicating the dominant media identifier for the first period of time via a text-only messaging service to a storage facility. In some examples, communicating the dominant media identifier via the text-only messaging service comprises incorporating the dominant media identifier into a text message and omitting non-dominant ones of the media identifiers from the text message. In some examples, the text-only messaging service includes a restriction on a payload size for messages sent via the text-only messaging service. In some examples, the text-only messaging service is part of a subscription that includes a cellular data service plan. In some examples, communicating the dominant one of the media identifiers to the storage facility occurs in response to an unavailability of transmission via the cellular data service plan. In some examples, identifying the dominant one of the media identifiers comprises determining which of the media identifiers was most frequently detected over the period of time at the collection device. In some examples, at least one of the media identifiers comprises at least one of a channel number, a signature, a watermark, a program name, metadata or a source identification code.

An example tangible machine readable storage medium comprises instructions that, when executed, cause a machine to analyze a plurality of media identifiers collected over a first period of time to identify a dominant one of the media identifiers for the first period of time; and communicate the dominant media identifier for the first period of time via a text-only messaging service to a storage facility. In some examples, the instructions cause the machine to communicate the dominant media identifier via the text-only messaging service by incorporating the dominant media identifier into a text message and omitting non-dominant ones of the media identifiers from the text message. In some examples, the text-only messaging service includes a restriction on a payload size for messages sent via the text-only messaging service, and the text-only messaging service is part of a subscription that includes a cellular data service plan. In some examples, the instructions cause the machine to communicate the dominant one of the media identifiers to the storage facility in response to an unavailability of transmission via the cellular data service plan. In some examples, the instructions cause the machine to identify the dominant one of the media identifiers by determining which of the media identifiers was most frequently detected over the period of time at the collection device. In some examples, at least one of the media identifiers comprises at least one of a channel number, a signature, a watermark, a program name, metadata or a source identification code.

An example apparatus includes a detector to detect media identifying information over a plurality of periods of time; an identifier to determine which of the media identifying information was most frequently detected during a first one of the periods of time; and a text message constructor to incorporate the most frequently detected media identifying information into a text message to be communicated to a remote device via a text-only messaging service. In some examples, the text message constructor is to omit the media identifying information detected less frequently than the most frequently detected media identifying information. In some examples, the apparatus further comprises an encrypter to encrypt the text message before transmission to the remote device. In some examples, the text-only messaging service includes a restriction on a payload size for messages sent via the text-only messaging service. In some examples, the apparatus further comprises a cellular component to facilitate transmission of the text message via the text-only messaging service. In some examples, the text message constructor is to incorporate a people count and a time stamp corresponding to the most frequently detected media identifier into the text mes-

sage. In some examples, at least one of the media identifiers comprises at least one of a channel number, a signature, a watermark, a program name, metadata or a source identification code.

An example method includes evaluating, via a processor, one or more conditions associated with a first communication protocol of a device, the first communication protocol capable of transmitting a first amount of data, the device including a second communication protocol capable of transmitting a second amount of data less than the first amount of data; and, when the evaluated one or more conditions meet a first criteria in connection with a plurality of piece of collected data, identifying a dominant one of the pieces of collected data and using the second communication protocol to communicate the dominant piece of data to a second device different from the first device. In some examples, the method further comprises using the first communication protocol to communicate the data to the second device when the evaluated one or more conditions meet a second criteria. In some examples, the first criteria comprises the first protocol being unavailable for communication, and the second criteria comprises the first protocol being available for communication. In some examples, the first criteria comprises the first protocol being unlikely to successfully deliver the data to the second device, and the second criteria comprises the first protocol being likely to successfully deliver the data to the second device. In some examples, the collected pieces of data comprise audience measurement data collected by the device, and the second device is associated with a central facility of an audience measurement entity. In some examples, the second communication protocol facilitates a text-only messaging service.

An example tangible machine readable storage medium comprising instructions that, when executed, cause a machine to evaluate one or more conditions associated with a first communication protocol of a device, the first communication protocol capable of transmitting a first amount of data, the device including a second communication protocol capable of transmitting a second amount of data less than the first amount of data; and when the evaluated one or more conditions meet a first criteria in connection with a plurality of piece of collected data, identify a dominant one of the pieces of collected data and use the second communication protocol to communicate the dominant piece of data to a second device different from the first device. In some examples, the instructions cause the machine to use the first communication protocol to communicate the data to the second device when the evaluated one or more conditions meet a second criteria. In some examples, the first criteria comprises the first protocol being unavailable for communication, and the second criteria comprises the first protocol being available for communication. In some examples, the first criteria comprises the first protocol being unlikely to successfully deliver the data to the second device, and the second criteria comprises the first protocol being likely to successfully deliver the data to the second device. In some examples, the collected pieces of data comprise audience measurement data collected by the device, and the second device is associated with a central facility of an audience measurement entity. In some examples, the second communication protocol facilitates a text-only messaging service.

An example apparatus includes a switcher to set a communication protocol to be used to communicate data from a device, wherein the device is capable of transmitting information via a first communication protocol capable of transmitting a first amount of data, and the device is capable of transmitting information via a second communication protocol capable of transmitting a second amount of data less than the first amount of data; an identifier to identify a dominant one of a plurality of identifiers collected over a period of time; and an evaluator to evaluate one or more conditions associated with the first communication protocol, wherein the switcher is to set the device to transmit the dominant identifier to a second device when the evaluated one or more conditions meet a first criteria, and wherein the switcher is to set the device to transmit each of the plurality of identifiers to the second device when the evaluated one or more conditions meet a second criteria. In some examples, transmitting the dominant identifier to the second device when the evaluated one or more conditions meet the first criteria comprises communicating the dominant identifier via the second communication protocol. In some examples, the second communication protocol facilitates a text-only messaging service. In some examples, transmitting each of the identifiers to the second device when the evaluated one or more conditions meet the second criteria comprises communicating each of the identifiers via the first protocol. In some examples, the first communication protocol facilitates a standard data service. In some examples, the first criteria comprises the first protocol being unavailable for communication, and the second criteria comprises the first protocol being available for communication. In some examples, the first criteria comprises the first protocol being unlikely to successfully deliver data to the second device, and the second criteria comprises the first protocol being likely to successfully deliver data to the second device. In some examples, the identifiers comprise audience measurement data collected by the device, and the second device is associated with a central facility of an audience measurement entity.

An example method includes collecting media identifiers over a period of time; identifying a first one of the media identifiers that was most frequently detected over the period of time; and incorporating, via a processor, the first one of the media identifiers into a first portion of a text message for communication to a second device. In some examples, the method further comprises incorporating a people count into a second portion of the text message. In some examples, the first portion of the text message is designated to receive media identifiers according to a format, and the second portion of the text message is designated to receive people counts according to the format. In some examples, a determination that a standard data service is unavailable or unlikely to successfully delivery data triggers the incorporation of the first media identifier into the text message. In some examples, the method further comprises transmitting the text message to a central facility via a text-only message service.

An example tangible machine readable storage medium comprising instructions that, when executed, cause a machine to collect media identifiers over a period of time; identify a first one of the media identifiers that was most frequently detected over the period of time; and incorporate the first one of the media identifiers into a first portion of a text message for communication to a second device. In some examples, the instructions cause the machine to incorporate a people count into a second portion of the text message. In some examples, the first portion of the text message is designated to receive media identifiers according to a format, and the second portion of the text message is designated to receive people counts according to the format. In some examples, a determination that a standard data service is unavailable or unlikely to successfully delivery data triggers the incorporation of the first media identifier into the text message. In some examples, the instructions cause the machine to transmit the text message to a central facility via a text-only message service.

An example apparatus includes a detector to collect media identifiers over a period of time; an identifier a first one of the media identifiers that was most frequently detected over the period of time; and a constructor to incorporate the first one of the media identifiers into a first portion of a text message for communication to a second device. In some examples, the constructor is to incorporate a people count into a second portion of the text message. In some examples, the first portion of the text message is designated to receive media identifiers according to a format, and the second portion of the text message is designated to receive people counts according to the format. In some examples, a determination that a standard data service is unavailable or unlikely to successfully delivery data triggers the incorporation of the first media identifier into the text message. In some examples, the apparatus further comprises an interface to facilitate transmission of the text message to a central facility via a text-only message service.

An example method includes identifying which portion of a text message received from a device is designated to a media identifier, the media identifier being a most frequently detected one of a plurality media identifiers detected over a period of time at a device; extracting, via a processor, information from the identified portion of the text message; and storing the extracted information in a memory. In some examples, the method further comprises identifying which portion of the text message is designated to a people count, and extracting information from the people count portion of the text message. In some examples, the method further comprises translating the extracted media identifier to identify a source associated with the media identifier. In some examples, translating the extracted media identifier comprises searching a lookup table using the media identifier as a query. In some examples, the information extracted from the media identifier portion of the text message comprises one of a signature, a code, a watermark, or a channel number.

An example tangible machine readable storage medium comprises instructions that, when executed, cause a machine to identify which portion of a text message received from a device is designated to a media identifier, the media identifier being a most frequently detected one of a plurality media identifiers detected over a period of time at a device; extract information from the identified portion of the text message; and store the extracted information in a memory. In some examples, the instructions cause the machine to identify which portion of the text message is designated to a people count, and extract information from the people count portion of the text message. In some examples, the instructions cause the machine to translate the extracted media identifier to identify a source associated with the media identifier. In some examples, the instructions cause the machine to translate the extracted media identifier by searching a lookup table using the media identifier as a query. In some examples, the information extracted from the media identifier portion of the text message comprises one of a signature, a code, a watermark, or a channel number.

An example apparatus includes an identifier to identify which portion of a text message received from a device is designated to a media identifier, the media identifier being a most frequently detected one of a plurality media identifiers detected over a period of time at a device; an extractor to extract information from the identified portion of the text message; and a memory to store the extracted information. In some examples, the identifier is to identify which portion of the text message is designated to a people count, and the extractor is to extract information from the people count portion of the text message. In some examples, the apparatus further comprises a translator to translate the extracted media identifier to identify a source associated with the media identifier. In some examples, translating the extracted media identifier comprises searching a lookup table using the media identifier as a query. In some examples, the information extracted from the media identifier portion of the text message comprises one of a signature, a code, a watermark, or a channel number.

Although certain example apparatus, methods, and articles of manufacture have been disclosed herein, the scope of coverage of this patent is not limited thereto. On the contrary, this patent covers all apparatus, methods, and articles of manufacture fairly falling within the scope of the claims of this patent.

What is claimed is:

1. A method, comprising:

analyzing, via a processor, a plurality of media identifiers collected during a period of time;

identifying, via the processor, a dominant media identifier from the plurality of media identifiers by determining which of the plurality of media identifiers was most frequently detected during the period of time;

selecting, from the plurality of media identifiers, only the dominant media identifier for incorporation into a text message;

incorporating the selected dominant media identifier into the text message and omitting all non-dominant ones of the plurality of media identifiers from the text message; and

communicating the text message via a text messaging service to a storage facility.

2. A method as defined in claim **1**, wherein the text messaging service includes a restriction on a payload size for messages sent via the text messaging service.

3. A method as defined in claim **1**, wherein the text messaging service is part of a subscription that includes a cellular data service plan.

4. A method as defined in claim **3**, wherein the communicating of the text message to the storage facility occurs in response to an unavailability of transmission via the cellular data service plan.

5. A method as defined in claim **1**, wherein at least one of the plurality of media identifiers includes at least one of a channel number, a signature, a watermark, a program name, metadata or a source identification code.

6. A method as defined in claim **1**, further including scheduling the period of time, wherein the plurality of media identifiers are analyzed in response to the period of time ending.

7. A method as defined in claim **1**, further including communicating a people count and a time stamp corresponding to the dominant media identifier via the text message.

8. A tangible computer readable storage medium comprising instructions that, when executed, cause a machine to at least:

analyze a plurality of media identifiers collected during a period of time;

identify a dominant media identifier from the plurality of media identifiers by determining which of the plurality of media identifiers was collected most often during the period of time;

generate a text message including the dominant media identifier and no other media identifier; and

communicate the text message via a text messaging service to a storage facility.

9. A storage medium as defined in claim **8**, wherein the text messaging service includes a restriction on a payload size for

messages sent via the text messaging service, and the text messaging service is part of a subscription that includes a cellular data service plan.

10. A storage medium as defined in claim **9**, wherein the instructions, when executed, cause the machine to communicate the text message to the storage facility in response to an unavailability of transmission via the cellular data service plan.

11. A storage medium as defined in claim **8**, wherein the instructions, when executed, cause the machine to determine which of the plurality of media identifiers was collected most often by determining which of the media identifiers was most frequently detected during the period of time at a collection device implemented in a media exposure environment.

12. A storage medium as defined in claim **8**, wherein at least one of the plurality of media identifiers includes at least one of a channel number, a signature, a watermark, a program name, metadata or a source identification code.

13. A storage medium as defined in claim **8**, wherein the instructions, when executed, cause the machine to communicate a people count and a time stamp corresponding to the dominant media identifier via the text message.

14. An apparatus, comprising:

a detector to detect a plurality of media identifiers over a plurality of periods of time;

an identifier to determine which of the plurality of media identifiers was most frequently detected during one of the periods of time; and

a text message constructor to:

incorporate the most frequently detected media identifier into a text message to be communicated to a remote device via a text messaging service; and

omit all of the plurality of media identifiers detected less frequently than the most frequently detected media identifier from the text message.

15. An apparatus as defined in claim **14**, further including an encrypter to encrypt the text message before transmission to the remote device.

16. An apparatus as defined in claim **14**, wherein the text messaging service includes a restriction on a payload size for messages sent via the text messaging service.

17. An apparatus as defined in claim **14**, further including a cellular component to facilitate transmission of the text message via the text messaging service.

18. An apparatus as defined in claim **14**, wherein the text message constructor is to incorporate a people count and a time stamp corresponding to the most frequently detected media identifier into the text message.

19. An apparatus as defined in claim **14**, wherein the media identifier includes at least one of a channel number, a signature, a watermark, a program name, metadata or a source identification code.

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